What is claimed is:

1. A mass spectrometer adapted for underwater use comprising:

a watertight case having an inlet;

means for transforming an analyte molecule from a solution phase into a gas phase positioned within the case;

means for directing a fluid to the transforming means from the inlet; and

a linear quadrupole mass filter for analyzing the gas-phase analyte molecule to determine an identity thereof.

2. The mass spectrometer recited in Claim 1, wherein the transforming means comprises an introduction probe comprising a membrane having selective transport properties, the membrane positioned between the directing means and the analyzing means.

3. The mass spectrometer recited in Claim 2, wherein the membrane has selective transport properties for nonpolar compounds.

4. The mass spectrometer recited in Claim 3, wherein the membrane comprises polydimethylsiloxane.

5. The mass spectrometer recited in Claim 3, further comprising means for regulating a temperature of the fluid along the directing means.

6. The mass spectrometer recited in Claim 1, further comprising a first reservoir for holding a control fluid, and wherein the directing means comprises a pump having means for selectively directing fluid from the first reservoir to the transforming means.

7. The mass spectrometer recited in Claim 1, wherein the analyzing means further comprises a computer in electronic communication with the mass filter for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

8. The mass spectrometer recited in Claim 1, further comprising a housing surrounding the mass filter and a pump for providing a vacuum within the mass filter housing.

9. The mass spectrometer recited in Claim 8, wherein the pump comprises a turbo-molecular drag pump and two diaphragm pumps connected in series.

10. The mass spectrometer recited in Claim 9, further comprising means for dissipating heat generated by the pump.

11. The mass spectrometer recited in Claim 10, wherein the heat dissipating means comprises a heat sink plate in thermal contact with a heat-conducting material in contact with the case.

12. The mass spectrometer recited in Claim 1, further comprising a means for creating and maintaining a vacuum within the analyzing means in the watertight case.

13. The mass spectrometer recited in Claim 1, wherein the watertight case comprises a first and a second watertight cases, the transforming means and the analyzing means residing in the second case, and the directing means residing in the first case.

14. The mass spectrometer recited in Claim 1, wherein the transforming means comprises an atmospheric pressure ionization device.

15. The mass spectrometer recited in Claim 14, wherein the pressure ionization device comprises an electrospray ionization device.

16. The mass spectrometer recited in Claim 14, further comprising a third watertight case and a pump for creating a vacuum within the analyzing means, the pump positioned within the third case.

17. A modular, submersible mass spectrometry system comprising a plurality of sealed, substantially fluid-tight pressure vessels for operating in an aqueous environment, the system comprising:

a fluidic control pressure vessel containing:

an inlet from and an outlet to an exterior of the flow injection pressure vessel; and

a pump in fluid communication with a control fluid and a sample fluid having a means for selectively pumping the control fluid and the sample fluid to the outlet;

a mass spectrometer pressure vessel containing:

an introduction probe in fluid communication with the fluidic control pressure vessel outlet for transforming an analyte gas molecule present in fluid therefrom comprising a membrane having selective transport properties for nonpolar volatile compounds, the introduction probe for transforming an analyte gas molecule present in fluid from the fluid control pressure vessel outlet from a solution phase into a gas phase;

a fluid line for establishing fluid communication between the fluidic control pressure vessel outlet and the introduction probe;

a linear quadrupole mass filter in fluid communication with the introduction probe for collecting data on the gas-phase analyte molecule; and

data analysis means for receiving the data collected by the mass filter and performing an analysis thereof to determine an identity of the gas-phase analyte molecule;

a roughing pump pressure vessel containing a vacuum pump for providing low-pressure conditions in the mass filter; and

a line connecting the vacuum pump with the mass filter.

18. The system recited in Claim 17, wherein the introduction probe membrane comprises polydimethylsiloxane.

19. The system recited in Claim 17, further comprising means for regulating a temperature of the fluid pumped to the introduction probe.

20. The system recited in Claim 17, wherein the data analysis means comprises a computer in electronic communication with the mass filter having software resident thereon for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

21. The system recited in Claim 17, wherein the vacuum pump comprises two diaphragm pumps connected in series, and further comprising a turbo-molecular drag pump housed within the mass spectrometer vessel and in communication with the line between the two diaphragm pumps and the mass filter.

22. The system recited in Claim 17, further comprising means for dissipating heat generated by the vacuum pump.

23. The system recited in Claim 22, wherein the heat dissipating means comprises a heat sink plate positioned within the pump vessel in thermal contact with a heat-conducting material in contact with the pump vessel.

24. A method for identifying a molecule in an aqueous environment comprising the steps of:

directing a fluid into a substantially fluid-tight case;

transforming an analyte molecule in the fluid from a solution phase into a gas phase within the case; and

analyzing the analyte molecule using a linear quadrupole mass filter to determine an identity thereof.

25. The method recited in Claim 24, wherein the transforming step comprises using an introduction probe comprising a membrane having selective transport properties for nonpolar volatile compounds.

26. The method recited in Claim 25, wherein the membrane comprises polydimethylsiloxane.

27. The method recited in Claim 24, further comprising regulating a temperature of the fluid directed to the introduction probe.

28. The method recited in Claim 24, wherein the directing step comprises selectively directing fluid from each of a control fluid source and a sample fluid source to the introduction probe.

29. The method recited in Claim 24, wherein the analyzing step further comprises using a computer in electronic communication with the mass filter for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

30. The method recited in Claim 24, further comprising providing a vacuum within a housing surrounding the mass filter.

31. The method recited in Claim 30, wherein the pumping step comprises using a turbo-molecular drag pump and two diaphragm pumps connected in series.

32. The method recited in Claim 24, further comprising dissipating heat generated by the pump.

33. The method recited in Claim 32, wherein the heat dissipating step comprises using a heat sink plate in thermal contact with a heat-conducting material in contact with the case.

34. A method for making a mass spectrometer adapted for underwater use comprising the steps of:

positioning a means for transforming an analyte molecule from a solution phase into a gas phase within a watertight case having an inlet;

positioning a means for directing a fluid to the transforming means from the inlet within the case; and

positioning a linear quadrupole mass filter for analyzing the gas-phase analyte molecule to determine an identity thereof within the case.

35. The method recited in Claim 34, wherein the transforming means comprises an introduction probe comprising a membrane having selective transport properties for nonpolar volatile compounds, the membrane positioned between the directing means and the analyzing means.

36. The method recited in Claim 35, wherein the membrane comprises polydimethylsiloxane.

37. The method recited in Claim 34, further comprising the step of positioning a means for regulating a temperature of the fluid along the directing means within the case.

38. The method recited in Claim 34, further comprising the step of positioning a first reservoir for holding a control fluid and a second reservoir for holding waste fluid within the case, and wherein the directing means positioning step comprises affixing a pump having means for selectively directing fluid from the first reservoir to the transforming means within the case.

39. The method recited in Claim 40, further comprising affixing a computer within the case and establishing electronic communication between the computer and the mass filter, the computer for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

40. The method recited in Claim 34, further comprising the step of surrounding the mass filter with a housing and providing a vacuum within the mass filter housing.

41. The method recited in Claim 40, further comprising dissipating heat generated within the case.

42. A method for making a modular, submersible mass spectrometry system comprising a plurality of sealed, substantially fluid-tight pressure vessels for operating in an aqueous environment, the method comprising the steps of:

positioning within a fluidic control pressure vessel:

an inlet from and an outlet to an exterior of the flow injection pressure vessel; and

a pump in fluid communication with a control fluid and a sample fluid, having means for selectively pumping the control fluid and the sample fluid from the to the outlet;

positioning within a mass spectrometer vessel:

an introduction probe in fluid communication with the flow injection pressure vessel outlet for transforming a gas molecule present in fluid therefrom comprising a membrane having selective transport properties for nonpolar volatile compounds, the introduction probe for transforming an analyte molecule present in fluid from the fluidic control pressure vessel outlet from a solution phase into a gas phase;

a fluid line for establishing fluid communication between the fluidic control pressure vessel outlet and the introduction probe;

a linear quadrupole mass filter in fluid communication with the introduction probe for collecting data on the gas-phase analyte molecule; and

data analysis means for receiving the data collected by the mass filter and performing an analysis thereof to determine an identity of the gas-phase analyte molecule;

positioning within a pump vessel a vacuum pump for providing low-pressure conditions in the mass filter; and

connecting the vacuum pump with the mass filter.

43. The method recited in Claim 42, wherein the introduction probe membrane comprises polydimethylsiloxane.

44. The method recited in Claim 42, further comprising the step of positioning within the fluidic control pressure vessel a means for regulating a temperature of the fluid pumped to the introduction probe.

45. The method recited in Claim 42, wherein the data analysis means comprises a computer in electronic communication with the mass filter having software resident thereon for controlling data acquisition of the mass filter and for performing analysis of data collected by the mass filter.

46. The method recited in Claim 42, wherein the vacuum pump comprises two diaphragm pumps connected in series, and further comprising the step of positioning a turbo-molecular drag pump within the mass spectrometer vessel and between the two diaphragm pumps and the mass filter.

47. The method recited in Claim 42, further comprising the step of positioning a means for dissipating heat generated by the vacuum pump within the pump vessel.